UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
OSB1999-0224

August 24, 1999

Karen Kochenbach
U.S. Army Corps of Engineers
Portland District, CENWP-CO-GP
P.O. Box 2946
Portland, OR 97208-2946

Re: Consultation on the Effects of Stream Channel Modifications on an Unnamed Tributary of Cook Creek (Permit ID No. 97-1571), Sutherlin, Douglas County, Oregon

Dear Ms. Kochenbach:

This concludes our correspondence regarding the effects on Umpqua River (UR) cutthroat trout and Oregon Coast (OC) coho salmon from issuance of a Section 404 permit (Permit ID No. 97-1571) to culvert or realign approximately 1,360 feet of an unnamed tributary to Cook Creek, which is itself a tributary to Calapooya Creek, in Sutherlin, Douglas County, Oregon. The permit applicant is the Alaska-Sutherlin Knolls Corporation (ASKC) which proposes to conduct the proposed action as part of the construction of a commercial development, beginning in the summer of 1999.

The UR cutthroat trout was listed by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA) as endangered on August 9, 1996 (61 FR 41514). Critical habitat for UR cutthroat trout was designated by NMFS on January 9, 1998 (63 FR 1338). OC coho salmon was listed by NMFS under the ESA as threatened on August 10, 1998 (63 FR 42587), with an effective listing date of October 9, 1998; critical habitat for OC coho salmon was proposed on May 10, 1999 (64 FR 24998). Both UR cutthroat trout and OC coho salmon occur in the Calapooya Creek watershed. This consultation is undertaken under section 7(a)(2) of the ESA and its implementing regulations, 50 CFR Part 402.

In a letter dated September 2, 1998, the Portland District of the U.S. Army Corps of Engineers (COE) requested informal consultation on the effects of granting a Clean Water Act 404 permit (Permit ID No. 97-1571) on UR cutthroat trout and OC coho salmon. NMFS replied to the COE in a September 11, 1998 letter, requesting information to confirm the ASKC consultant's belief that the unnamed tributary was a man-made drainage ditch. NMFS reviewed historic aerial

photographs provided by the consultant and concluded in a November 4, 1998 letter, that a natural stream channel had likely been present on the ASKC property and that the unnamed tributary,

while greatly altered by human activities, still has the potential to provide habitat for anadromous salmonids. Because the proposed culverting of 670 feet of the unnamed tributary would permanently eliminate anadromous salmonid habitat in that stream reach, NMFS concluded that it could not concur with the COE's not likely to adversely affect determination. The COE agreed to enter into a formal consultation on the likely effects of the issuance of the proposed permit on both UR cutthroat trout and OC coho salmon.

Many aspects of the project were discussed and agreed-upon in a December 17, 1998, meeting with ASKC, its consultants, and several state and Federal agencies, but several months passed in early 1999 when little information was forthcoming from ASKC. In an April 12, 1999 letter, Mr. William Davis, of your staff, informed NMFS that a key portion of the proposal had been withdrawn by ASKC. Finally, a May 27, 1999, 404(b)(1) permit application was forwarded by your staff to NMFS; this application described the proposed project in its final form.

Enclosed is the Biological Opinion on the COE's issuance of a 404 permit to ASKC, authorizing the incidental take of UR cutthroat trout and OC coho salmon that may be caused by this action, provided that the terms and conditions of the incidental take statement are met. If you have any questions regarding this opinion, please contact Dan Kenney, Fishery Biologist at (541) 957-3385.

Sincerely,

William Stelle, Jr.
Regional Administrator

cc: Ken Franklin, Oregon Division of State Lands
Tom Loynes, Oregon Department of Fish and Wildlife
Dave Peterson, U.S. Fish and Wildlife Service
Martin Schott, Schott and Associates
Renee Burke, Alaska-Sutherlin Knolls Corporation

Endangered Species Act - Section 7
Consultation

BIOLOGICAL OPINION

Effects of Stream Channel Modifications (Permit ID No. 97-1571) to an Unnamed Tributary of Cook Creek on Umpqua River Cutthroat Trout and Oregon Coast Coho Salmon

Agency: Portland District, U.S. Army Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Date Issued: August 24, 1999

Refer to: OSB1999-0224

TABLE OF CONTENTS

I. Background

The Umpqua River (UR) cutthroat trout (*Oncorhynchus clarki clarki*) was listed by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA) as endangered on August 9, 1996 (61 FR 41514). Critical habitat for UR cutthroat trout was designated by NMFS on January 9, 1998 (63 FR 1338). Oregon Coast (OC) coho salmon were listed by NMFS under the ESA as threatened on August 10, 1998 (63 FR 42587), with an effective listing date of October 9, 1998; critical habitat for this ESU was proposed on May 10, 1999 (64 FR 24998). UR cutthroat trout occur in the Umpqua River Basin in southwest Oregon, while OC coho salmon occur from Cape Blanco north to the mouth of the Columbia River (excluded).

In a letter dated September 2, 1998, the Portland District of the U.S. Army Corps of Engineers (COE) requested informal consultation on the effects of granting a Clean Water Act 404(b)(1) permit (Permit ID No. 97-1571) on UR cutthroat trout and OC coho salmon. The proposed permit would allow the Alaska-Sutherlin Knolls Corporation (ASKC) to fill 6.48 acres of wetland and to culvert, channelize, and/or move at least 1,360 feet of a reach of an unnamed tributary (UT) to Cook Creek, near Sutherlin, Oregon. The purpose of the proposed actions would be to allow the construction of a commercial development.

The NMFS reviewed the June 9, 1998, Public Notice for Permit Application for the proposed project and commented under the Fish and Wildlife Coordination Act in a July 24, 1998, letter. In the comment letter, NMFS pointed out to the COE that the UT (described in the Public Notice as a "ditched non-fish bearing drainageway"), despite adverse modifications, supported substantial riparian vegetation and at least aquatic insects and frogs, and flowed in early July with a volume roughly equal to that of Cook Creek. NMFS also reminded the COE that Calapooya Creek (to which Cook Creek is tributary) supports UR cutthroat trout and OC coho salmon and that the COE had a responsibility under the ESA to determine whether issuance of the proposed 404(b)(1) permit would affect either of these species.

As noted above, the COE requested informal consultation on the issuance of the permit to ASKC in a September 2, 1998, letter. The NMFS replied to the COE in a September 11, 1998 letter, requesting information to confirm the ASKC consultant's belief that the UT is a man-made drainage ditch. The NMFS reviewed historic aerial photographs provided by the consultant, and concluded in a November 4, 1998, letter that a natural stream channel had likely been present on the ASKC property, and that the UT, while greatly altered by human activities, still has the potential to provide habitat for anadromous salmonids. Because the proposed culverting of 670 feet of the UT would permanently eliminate anadromous salmonid habitat in that stream reach, the NMFS concluded that it could not concur with the COE's not likely to adversely affect determination. The COE agreed to enter into a formal consultation on the likely effects of the issuance of the proposed permit on both UR cutthroat trout and OC coho salmon .

The objective of this biological opinion is to determine whether actions that the COE proposes to permit under its Clean Water Act authority for application #97-1571 are likely to jeopardize UR cutthroat trout, listed as endangered under the ESA, or OC coho salmon, listed as threatened under the ESA, or result in destruction or adverse modification of designated critical habitat for UR cutthroat trout. Although NMFS expects some effects to anadromous fish habitat from these actions, the effects to essential habitat are expected to be insignificant because of proposed mitigation. Therefore, substantial adverse effects to individual UR cutthroat trout and OC coho salmon are not expected. The overall effect of the action is likely to be neutral or beneficial.

II. Proposed Action

The proposed action is the COE's issuance of an individual permit under Section 404 of the Clean Water Act to ASKC. The permit would allow ASKC to fill 6.48 acres of wetland and culvert, channelize, and/or move not more than 1,360 feet of an UT to Cook Creek. The proposed wetland to be filled is currently a mowed pasture with no direct surface water connection to the UT or Cook Creek. This particular aspect of the proposed action will not be addressed further in this opinion. About 1,500 feet of the UT occurs on the ASKC property along with approximately 200 feet of Cook Creek. As noted above, approximately 1,360 feet of the UT on the subject property is proposed for modification, while the Cook Creek reach on the property is in an area that will not be developed.

Specifically, the UT enters the east end of the ASKC property after passing under Interstate 5 through a culvert. The I-5 culvert appears to be impassable by fish due to length and gradient. The UT flows to the southwest for about 100 feet, passes onto a non-ASKC land parcel for about 300 feet and then back onto the ASKC property. The first 100 feet of the UT on the ASKC land, as well as the first 40 feet after the UT's return to ASKC parcel, are on a portion of the property that will not be developed. The remainder of the UT on ASKC land would be modified under the 404(b)(1) permit. Moving downstream, the next 150 feet of the UT would be excavated and recontoured into a grassy swale. Below the swale, the UT would be confined into a 24- to 36-inch smooth-bored polyethylene culvert for about 670 feet to allow paving and construction above the channel. Below the culvert outlet, a pool would be constructed for energy dissipation and aquatic habitat. Downstream from the pool, nearly to the confluence of the UT with Cook Creek (about 690 feet), the existing channel would be moved to the base of the steep hill on the northeast side of the property to allow for more extensive development. A drainage ditch, which enters the UT from the northeast just below the proposed energy dissipation pool, would also be excavated and recontoured into a grassy swale.

As mitigation for the permanent destruction of the 670 feet of the UT, blockage of upstream passage by fish through and above this stream reach, and movement of much of the remainder of the downstream portion of the UT, ASKC proposes several actions. First, ASKC would replace the existing culvert which passes Cook Creek under the driveway to the golf course adjacent to the ASKC property. This 36-inch round corrugated metal pipe culvert is currently perched about a foot above the surface elevation of the stream during average flow conditions and is likely to cause at least a partial fish passage barrier. ASKC would replace the existing culvert with a bottomless culvert of sufficient size to allow fish passage over a wide variety of flow conditions.

Second, ASKC would reconstruct and revegetate the channel of the UT between the 670-foot culverted section and the UT's confluence with Cook Creek. Currently, because of frequent excavation, this stream reach (about 680 feet long) is morphologically simplified and has little woody riparian vegetation. Under the direction of Oregon Department of Fish and Wildlife (ODFW) and/or NMFS fisheries biologists, ASKC would restore sinuosity and morphological variability to the stream channel. In addition, gravel substrate and large woody debris would be added to the stream at several sites. Further, native shrubs and trees would be planted in the riparian zones of the stream and Cook Creek.

Third, as a byproduct of its mitigation for wetland fill on its property, ASKC is likely to improve water quality in Cook Creek during low flow periods. ASKC will maintain a newly constructed wetland on the golf course property to the northwest of the ASKC property. The golf course is currently irrigated with treated wastewater from the Sutherlin municipal wastewater treatment plant (WWTP) and the mitigation wetland, at a volume of 300,000 to 450,000 gallons per day, or 0.4 to 0.6 cubic feet per second (Lou Douglas, Supervisor, Sutherlin WWTP, pers. comm., January 22, 1999), would also be irrigated with the wastewater. During most of the year, the treatment plant discharges its effluent to Calapooya Creek, but from June 1 through October 31, or outside this period when irrigation water is needed at the golf course, the treatment plant pumps effluent to a pond on the golf course from which the irrigation water is withdrawn. Currently, not all of the wastewater pumped to the pond is used for irrigation because the golf course is not irrigated during most daylight hours and the pond often overflows into a series of ditches which connect to Cook Creek about 1,200 feet downstream of the ASKC property. In addition, a substantial portion of the wastewater used for irrigation also enters Cook Creek as groundwater after infiltrating the soil.

Because the mitigation wetland would also be watered from the golf course pond, much or all of the pond water which previously overflowed into ditches and directly into Cook Creek will also infiltrate into the soil and eventually enter Cook Creek as groundwater. While there may be a net reduction in flow to Cook Creek as a result of maintaining the constructed wetland (due to evaporation, evapotranspiration, etc.), the water that does enter the creek will likely be cooler and otherwise of higher quality, and should also fluctuate less in volume. Also, considering that Sutherlin is a growing community, the volume of water processed in the treatment plant, and therefore discharged to Cook Creek, is likely to increase over time.

III. Biological Information and Critical Habitat

The listing status, biological information, and critical habitat elements for UR cutthroat trout and OC coho salmon are described in NMFS (1997b). Some site-specific information is provided below.

UR cutthroat trout inhabit the Umpqua River Basin of southwest Oregon, including tributaries of Calapooya Creek, and the Evolutionarily Significant Unit (ESU)[1] consists of resident, potamodromous, and anadromous life histories. Individuals of all three forms have the potential to inhabit Cook Creek and the UT in the vicinity of the proposed commercial development. Spawning by UR cutthroat trout is unlikely to occur at the site because of the predominantly clay substrate, but Cook Creek is likely used as a rearing and feeding area by both adults and juveniles of the ESU. The UT, because of its degraded state and small size, is likely used by adult and juvenile UR cutthroat trout predominantly as an area of shelter during high flows in the mainstem of Cook Creek.

Historically, adult anadromous cutthroat trout passed Winchester Dam (on the North Umpqua River) predominantly from late June through November, with peaks in mid-July and mid-October, while juvenile outmigration is thought to occur chiefly from March through October (Johnson *et al*. 1994). Adult migration patterns in Calapooya Creek and its tributaries are not known, but Trotter (1997) reports that adult sea-run cutthroat trout have been documented migrating into streams from July through March. A smolt trap operated near the mouth of Calapooya Creek captured juvenile cutthroat trout (some of which were smolted) from early March through the third week of June, 1998, with peak collection in mid-April (Elijah Waters, Bureau of Land Management, pers. comm., January 14, 1999). Flow in Cook Creek and the UT at the site is likely to be low and warm in the summer, as is typical for low elevation streams in Douglas County. The ODFW has not documented the presence of cutthroat trout in Cook Creek, but because the species is known to occur in many nearby streams of similar size, it is likely that cutthroat trout also inhabit Cook Creek (Tom Loynes, Fisheries Biologist, ODFW, pers. comm., January 19, 1999).

OC coho salmon are an anadromous species which typically have a three-year life-cycle. Adults spawn in the late fall and winter, with fry emergence occurring the following spring. Juvenile coho salmon rear for about a year in natal streams and then outmigrate to the ocean as smolts in the spring. A smolt trap operated near the mouth of Calapooya Creek captured coho salmon smolts from early March through mid-May, 1998, with peak collection in mid-April (Elijah Waters, Bureau of Land Management, pers. comm., January 14, 1999). Some male coho salmon return to freshwater to spawn the fall and winter of the same year as their smolt migration, but the majority of adult OC coho salmon do not return to spawn until having spent about 18 months in the ocean. Adult OC coho salmon typically enter Calapooya Creek for spawning from November into January, but as noted above, the ASKC site does not provide suitable spawning habitat. It is possible that Cook Creek at the ASKC site provides some feeding and rearing habitat for juvenile OC coho salmon (see discussion under UR cutthroat trout above), but it is likely that the main use of the UT by OC coho salmon is as shelter from high flows in Cook Creek. The ODFW has documented the presence of coho salmon in Cook Creek (Tom Loynes, Fisheries Biologist, ODFW, pers. comm., January 19, 1999).

[1]For the purposes of conservation under the Endangered Species Act, an Evolutionarily Significant Unit is a distinct population segment that is substantially reproductively isolated from other conspecific population units and represents an important component in the evolutionary legacy of the species.

IV. Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by the consultation regulations (50 CFR Part 402). NMFS (1997a) describes how NMFS applies the ESA jeopardy and destruction/adverse modification of critical habitat standards to consultations for Federal land management actions in the Umpqua River basin.

As described in NMFS (1997a), the first steps in applying the ESA jeopardy standards are to define the biological requirements of listed or proposed species and to describe the species' current status as reflected by the environmental baseline. In the next steps, NMFS' jeopardy analysis often considers how proposed actions are expected to directly and indirectly affect specific environmental factors that define properly functioning aquatic habitat essential for the survival and recovery of the species. This type of analysis is set within the dual context of the species' biological requirements and the existing conditions under the environmental baseline (NMFS 1997a). Such an analysis takes into consideration an overall picture of the beneficial and detrimental activities taking place within the action area. In this proposed action, however, NMFS has determined that potential effects of the action on environmental factors are a less likely cause of harm to the listed species than direct physical injury. If direct physical injury or mortality to individuals of these species, or the net effect on the environmental baseline of the proposed activity is found to jeopardize the listed species, then NMFS must identify any reasonable and prudent alternatives to the proposed action.

A. Biological Requirements

For this consultation, NMFS finds that the biological requirements of UR cutthroat trout and OC coho salmon are best expressed in terms of current population status and environmental factors that define properly functioning freshwater aquatic habitat necessary for survival and recovery of the species. This information is summarized in NMFS (1997a). As discussed in section III., above, UR cutthroat trout and OC coho salmon likely use the subject portion of Cook Creek and the UT primarily as juvenile rearing and adult UR cutthroat trout feeding habitat, and as shelter during high flows. Therefore, the environmental factors that define properly functioning migration, rearing, spawning, and incubation habitat are necessary for survival and recovery of the species. Individual environmental factors include water quality, habitat access, physical habitat elements, channel condition, and hydrology. Properly functioning watersheds, where all of the individual factors operate together to provide healthy aquatic ecosystems, are also necessary for the survival and recovery of the listed species. This information is also summarized in NMFS (1997b). As discussed in section V, below, the NMFS does not expect that the commercial development of the ASKC property, with the proposed mitigation measures, will substantially adversely affect any of the environmental factors or essential features of UR cutthroat trout or OC coho salmon habitat.

B. Environmental Baseline

Current range-wide status of UR cutthroat trout and OC coho salmon under the environmental baseline. NMFS described the current population status of the UR cutthroat trout and OC coho

salmon in its status reviews (Johnson *et al.* 1994 and Weitkamp *et al.* 1995, respectively) and in the UR cutthroat trout final rule (August 9, 1996, 61 FR 41514) and the OC coho salmon proposed and final rules (July 25, 1995, 60 FR 38011; and August 10, 1998, 63 FR 42587). Critical habitat for UR cutthroat trout was designated by the NMFS on January 9, 1998 (63 FR 1338) and was proposed for OC coho salmon on May 10, 1999 (64 FR 24998). On April 5, 1999, the NMFS proposed to reclassify UR cutthroat trout as a candidate species because recent genetic studies have shown that the Umpqua River ESU is likely a portion of a larger Oregon Coast cutthroat trout ESU which is not thought to be in danger of extinction (64 FR 16397). UR cutthroat trout, however will remain listed as endangered until a final rule is published. The recent range-wide status of these species is summarized in NMFS (1997a).

Current status of UR cutthroat trout and OC coho salmon under the environmental baseline within the action area. The "action area" is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). The general action area is the Calapooya Creek basin.

As noted above, UR cutthroat trout and OC coho salmon use the action area primarily as juvenile rearing and adult (cutthroat) feeding habit and as shelter during high flows. The modification of the UT in the commercial development of the ASKC property would block upstream passage of fish to about 1,000 feet of stream and would eliminate all riparian and instream habitat on about 670 feet of 1,000. The mitigative measures proposed by ASKC, however, should enhance habitat in approximately 690 feet of the UT and substantial portions of Cook Creek so that the net effect of the development on salmonid habitat should be neutral or slightly beneficial. Thus, while the environmental baseline of the Calapooya Creek basin is dominated by conditions rated largely as at risk or not properly functioning, based on assessments from Federal land management agencies, the proposed action would not likely affect the relatively poor baseline conditions. These conditions are likely the result of agricultural, urban, and forest management practices.

Based on the best information available on the current status of UR cutthroat trout and OC coho salmon (NMFS 1997a), NMFS assumptions given the information available regarding population status, population trends, and genetics (NMFS 1997b), and the relatively poor environmental baseline conditions within the action area (see the UR cutthroat trout final listing rule and OC coho salmon proposed listing rule), NMFS concludes that not all of the biological requirements of the species within the action area are currently being met under the environmental baseline. Actions that do not retard attainment of properly functioning aquatic conditions, when added to the environmental baseline, are necessary to meet the needs of the species for survival and recovery.

V. Analysis of Effects

A. Effects of Proposed Action

The effects determination was made using a method for evaluating current aquatic conditions (i.e., the environmental baseline) and predicting effects of actions on them. This process is described in the

document *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). This assessment method was designed for the purpose of providing adequate information in a tabular form for NMFS to determine the effects of actions subject to consultation. The effects of actions are expressed in terms of the expected effect—restore, maintain, or degrade—on aquatic habitat factors in the project area.

The results of a completed checklist for a proposed action provides a basis for determining the overall effects on the environmental baseline in the action area (see tables 1 and 2). Adverse effects to the environmental baseline from this action are expected to be small and mostly short-term (all aquatic habitat factors will be maintained at the watershed scale) because of project design and mitigation, while the majority of the long-term effects of the action on the site level should be positive.

The principal potential effects of the proposed commercial development of the ASKC site to UR cutthroat trout, OC coho salmon, and UR cutthroat trout critical habitat are related to the reduction of sheltering habitat in the UT during high flows in Cook Creek. The proposed action would also permanently eliminate allochthonous input to the UT and Cook Creek from the 670-foot reach of the UT that would be culverted. It is also likely that the type and extreme length of the culvert would hinder or prevent fish passage to the upper portion of the tributary. On the other hand, the mitigative actions proposed would increase the habitat complexity and the value to salmonids of the lower reach of the UT and of the Cook Creek reach on the ASKC property. The mitigative actions would also increase the accessibility of salmonids to the UT and to Cook Creek above the golf course driveway culvert to be replaced. Also, the addition of water to Cook Creek as a byproduct of wetland mitigation may be of value to aquatic organisms in these streams, including salmonids and their prey. Because the proposed construction activities would occur during the summer in-water work period (June 15 - September 15), it is likely that few, if any, UR cutthroat trout or OC coho salmon would be present in the UT because of low flows and high water temperatures.

Other potential effects on the listed species include those associated with the replacement and construction of road-crossing culverts, the replacement of soil and vegetation with hardened surfaces, and the introduction of oil, gasoline, antifreeze and other contaminants into the UT.

Extended culverting. The replacement of 670 feet of ditched and otherwise altered stream channel with a culvert would permanently remove essentially all remaining habitat values from that stream reach. The habitat condition of the stream reach, however, is currently poor as the reach has apparently been frequently ditched. As a result, the stream channel is straight and of uniform width, depth and gradient with a clay substrate. Ditching has been relatively deep to confine runoff to the channel and a berm of excavated material also occurs along much of the south streambank, so the stream has little or no interaction with its potential floodplain. No substantial woody vegetation or debris exists in or near the channel, although the riparian zone is well vegetated with grasses and rushes and some aquatic algae and macrophytes are also present in the channel. Water appears to flow in this reach of the channel year-round, although most or all of the summer flow is likely irrigation water from the golf course that infiltrates into the stream channel as groundwater.

While the stream and riparian habitat of the creek reach to be culverted is currently poor, water, some shade and overhead cover, some velocity shelter, and allochthonous input from riparian plants still exist. If the reach is culverted, these habitat values would be lost and it is likely that this loss would be permanent as the ground over the culvert would be paved over or built upon.
On the other hand, if the property is not developed or further altered, the stream reach would likely gradually develop better stream and riparian habitat. However, considering that the site is within the City of Sutherlin, as well in proximity to Interstate 5, development or other further disturbance seems likely.

Table 1. Summary checklist of site-level (portions of Cook Creek and its UT on the ASKC) environmental baseline and effects of the ASKC project on relevant indicators. Short-term (less than 1 year) impacts on relevant indicators are denoted by a minus (-) sign, and are not expected to alter the existing environmental baseline. Positive actions which do not completely restore an indicator are denoted by a plus (+) sign.

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality:						
Temperature		X			X (+)	
Sediment		X				X(-)
Chem. Contam./Nutr.		X				X
Habitat Access:						
Physical Barriers		X		X		X
Habitat Elements:						
Substrate			X		X (+)	
Large Woody Material			X		X (+)	
Pool Frequency			X		X (+)	
Pool Quality			X		X (+)	
Off-channel Habitat			X		X (+)	
Refugia			X		X (+)	
Channel Conditions:						
Width/Depth Ratio			X		X (+)	
Streambank Cond.		X			X	
Floodplain Connect.			X		X (+)	
Flow/Hydrology :						
Peak/Base Flows			X		X	
Drainage Network Incr.			X		X	
Watershed Conditions:						
Road Density/Loc.			X			X
Disturbance History			X			X
Riparian Zone			X		X (+)	X

[1] These three categories of function ("properly functioning," "at risk," and "not properly functioning") and the three effects ("restore," "maintain," and "degrade") are defined for each indicator in NMFS (1996).

Table 2. Summary checklist of watershed-level (Calapooya Creek) environmental baseline (BLM 1998) and effects of the ASKC project on relevant indicators.

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality:						
Temperature		X			X	
Sediment					X	
Chem. Contam./Nutr.		X			X	
Habitat Access:						
Physical Barriers		X			X	
Habitat Elements:						
Substrate			X		X	
Large Woody Material			X		X	
Pool Frequency			X		X	
Pool Quality			X		X	
Off-channel Habitat			X		X	
Refugia			X		X	
Channel Conditions:						
Width/Depth Ratio			X		X	
Streambank Cond.		X			X	
Floodplain Connect.			X		X	
Flow/Hydrology :						
Peak/Base Flows			X		X	
Drain. Network Inc.			X		X	
Watershed Conditions:						
Road Density/Loc.			X		X	
Disturbance History			X		X	
Riparian Zone			X		X	

1 These three categories of function ("properly functioning," "at risk," and "not properly functioning") and the three effects ("restore," "maintain," and "degrade") are defined for each indicator in NMFS (1996) .

Fish would also likely be prevented from accessing the UT above the 670-foot culvert because of its design and length. While a smooth bore is necessary to prevent debris from blocking the culvert, the lack of corrugations or other roughness elements would eliminate the areas of low velocity water which, when present, allow fish to swim through long culverts. Of the approximately 550 feet of UT above the 670-foot culvert on the west side of Interstate 5, the upper 200-300 feet are likely inaccessible to upstream migrating fish because of the presence of a constructed pond and/or a culvert from an abandoned gravel road. Some allochthonous input from the reach above the culvert would reach below the culvert, however.

In the short-term, the culverting would introduce sediment to the UT reach below and would create turbidity during in-water work. Compared to the long-term impacts of culverting, however, the effects of turbidity and sediment on UR cutthroat trout and OC coho salmon would be minor because: (1) There would be few or no salmonids present in the UT during the in-water work period due to low flows and high water temperature; (2) there is very little substrate present in the UT that would support spawning by UR cutthroat trout or OC coho salmon, so additional sediment is unlikely to affect spawning habitat or invertebrate production; (3) the soil consists of clay and water flow should be minimal, so little sediment is likely to mobilize; and (4) measures will be taken to minimize turbidity and sediment production.

Realignment/reconstruction. ASKC proposes to move, reconstruct, and revegetate much of the lower 690-foot reach of the UT. The channel and riparian characteristics of this reach are currently similar to that of the adjacent upstream reach that would be culverted. That is, the reach has been greatly morphologically simplified through excavation, has a well-established grass/rush riparian zone which provides shade and allochthonous input, but is deficient in water velocity refuge, such as pools or large woody debris.

The proposed reconstruction of the lower reach of the UT would introduce sediment and create turbidity during in-water work and would destroy the existing degraded stream channel and riparian zone in the short-term. The short-term production of sediment and turbidity should be of minimal significance because of reasons discussed under *Extended culverting*, above.

In the long-term, however, the stream reconstruction should create and maintain properly functioning in-stream habitat for fish and other aquatic life. The proposed reconstruction would include the addition of sinuosity, differentiation between low-flow and high-flow channels, creation of pool, riffle, and off-channel habitat, and introduction of gravel substrate and large woody debris. ASKC also proposes to plant the riparian zone of the lower reach of the UT and of Cook Creek—a minimum of a 25-foot buffer between the creek and paving or other engineered structures—with native riparian woody vegetation, including over 1,500 individual trees and shrubs. The creation and maintenance of a woody riparian zone should increase shade, allochthonous input, bank stability, and future large woody material supply.

Road crossing culverts. ASKC proposes to replace the existing perched culvert on the golf course access road, which passes the flow of Cook Creek on the west end of the property, with a new bottomless culvert that meets upstream passage requirements for adult and juvenile salmonids. ASKC may also construct a driveway to connect the parking area on the ASKC property to the golf course

access road. A culvert that would be installed on the lower reach of the UT for the driveway would also meet upstream fish passage requirements.

The proposed road crossing culvert replacement and construction would introduce sediment and create turbidity during in-water work. The short-term production of sediment and turbidity should be of minimal significance because of reasons discussed under *Extended culverting*, above.

Other. The development of the ASKC property would increase the rate of runoff from precipitation because parking lots and buildings would prevent water from infiltrating into the soil. ASKC, however, has proposed to construct two detention ponds and one detention pipe to prevent runoff from entering the UT at greater than the existing rate. Because of the detention structures, therefore, the reconstructed section of the UT and Cook Creek should not be subject to greater peak flows because of the additional hardened surfaces in the drainage. The construction of the outlets of the detention structures to the UT might introduce sediment and create turbidity during in-water work. The short-term production of sediment and turbidity should be of minimal significance because of reasons discussed under *Extended culverting*, above.

Oil, gasoline, and other contaminants from vehicles will be washed from the proposed parking lots during precipitation events, but each drainage catch basin in the parking lot will be equipped with an oil-water separator. The separators function by allowing oil, etc. to float to the surface of the catch basin while water is discharged to the detention ponds through a pipe below the water's surface. The combination of the oil-water separator and the detention basin should ensure that contaminants from the development would enter the UT in very small quantities, except possibly during peak runoff events. During such events, the dilution factor should be great enough that the contaminants should not affect fish or other aquatic organisms.

As noted above, the irrigation of the wetland mitigation areas on the golf course may enhance the in-stream and riparian habitat in Cook Creek because of increases in baseflow quantity and quality.

B. Effects of Interrelated and Interdependent Actions

Interrelated and interdependent actions are those that would not occur but for the proposed action. The action that is specifically subject to consultation is the COE's 404(b)(1) permit to modify wetlands and streams on the ASKC property. As noted above, the ASKC property is in a prime commercial location, so that this property and others nearby are likely to be developed in one way or another in the near future. Thus, the development of the ASKC property is not likely to affect the rate or type of development pattern of the surrounding area. The development will be tied into the Sutherlin potable water and sewage systems, but it is likely that a different property would be developed for the same purpose if the ASKC property is not developed. If not developed for commercial use, the streams and riparian areas on the ASKC property would likely be maintained in their current degraded condition, and fish passage would continue to be impaired by the perched culvert under the golf course access road.

C. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The action area for this consultation is the Calapooya Creek drainage. Future Federal actions, including land management activities, are being, or have been, reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to the proposed action. NMFS is not aware of any future new (or changes to existing) State and private activities within the action area that would cause greater impacts to listed species than presently occurs. NMFS assumes that future private and State actions will continue at similar intensities as in recent years.

VI. Conclusion

NMFS has determined that, based on the available information, permitting of the culverting and realignment of a tributary of Cook Creek under Section 404(b)(1) of the Clean Water Act, is not likely to jeopardize the continued existence of UR cutthroat trout and OC coho salmon, or result in the destruction or adverse modification of critical habitat for UR cutthroat trout or proposed critical habitat for OC coho salmon. NMFS used the best available scientific and commercial data to apply its jeopardy analysis, described in NMFS (1997a), when analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, described in NMFS (1997b), together with cumulative effects.

In reaching this conclusion, NMFS determined that the survival and recovery of UR cutthroat trout and OC coho salmon would not be appreciably diminished by the proposed action. This conclusion was reached primarily because: (1) The proposed construction would likely cause minor, short-term decreases in water quality, but the effects on essential features of UR cutthroat trout and OC coho salmon habitat are expected to be negligible; (2) direct disturbance of UR cutthroat trout and OC coho salmon due to turbidity, noise, etc. from the construction would be minimal due to the small area of the site and expected low distribution of salmonids near the site during the construction period; (3) while a section of the tributary would become uninhabitable and constitute an upstream passage barrier, this stream section is currently highly degraded and of marginal use to listed species; (4) the instream and riparian habitat of the realigned lower section of the stream should be substantially enhanced through plantings, introduction of large woody debris, pool development, etc.; (5) upstream passage into Cook Creek and the UT should be substantially enhanced; and (6) increased summer base flows in Cook Creek may enhance instream and riparian habitat.

VII. Reinitiation of Consultation

Based on the information provided, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions covered by this Biological Opinion. To ensure protection for a species assigned an unquantifiable level of take, reinitiation of consultation is required: (1) If any action is modified in a way that causes an effect on the listed species that was not previously considered in the information provided and this Biological Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or (3) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

VIII. References

Section 7(a)(2) of the ESA requires biological opinions to be based on the best scientific and commercial data available. This section identifies the data used in developing this opinion, in addition to the BA.

Bureau of Land Management, Roseburg District (BLM). 1998. Biological assessment of Pine Creek timber sale. Swiftwater Resource Area. Roseburg, Oregon.

Johnson, O.W., R.S. Waples, T.C. Wainwright, K.G. Neely, F. W. Waknitz, and L. T. Parker. 1994. Status review of Oregon's Umpqua River sea-run cutthroat trout. National Marine Fisheries Service, Coastal Zone and Estuarine Studies Division, Seattle, Washington.

NMFS (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale. Habitat Conservation Program, Portland, Oregon.

National Marine Fisheries Service (NMFS). 1997a. Application of Endangered Species Act standards to: Umpqua River cutthroat trout, Oregon Coast coho salmon, Southern Oregon/Northern California coho salmon, Oregon Coast steelhead, Klamath Mountain Province steelhead, Lower Columbia steelhead, chum salmon, chinook salmon, and sea-run cutthroat trout. NMFS, Northwest Region, Seattle, Washington. February, 1997.

National Marine Fisheries Service (NMFS). 1997b. Biological requirements and status under 1996 environmental baseline: Umpqua River cutthroat trout, Oregon Coast coho salmon, Oregon Coast steelhead, Southern Oregon/Northern California coho salmon, Klamath Mountain Province steelhead, Lower Columbia steelhead, and chum salmon. NMFS, Northwest Region, Seattle, Washington. September, 1997.

ODOT (Oregon Department of Transportation). Undated. ODOT General Minimization/ Avoidance Measures. 5 pp.

Trotter, P.C. 1997. Sea-run cutthroat trout: life history profile. Pages 7-15 *in* J.D. Hall, P.A. Bisson, and R.E. Gresswell, editors. Sea-run cutthroat trout: biology, management, and future conservation. Oregon Chapter, American Fisheries Society, Corvallis.

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-249, 258 pp.

IX. Incidental Take Statement

Sections 4(d) and 9 of the ESA prohibit any taking—harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct—of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of the Take

The NMFS anticipates that the action covered by this Biological Opinion has more than a negligible likelihood of resulting in incidental take of Umpqua River cutthroat trout and Oregon Coast coho salmon because of the potential for injury and mortality to non-target species/life stages due to the construction, existence, and operation of the trap. Effects of actions such as these are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on the species' habitat or population levels. Therefore, even though NMFS expects some low level incidental take to occur due to the actions covered by this Biological Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species itself. In instances such as these, the NMFS designates the expected level of take as "unquantifiable." Based on the information provided, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions covered by this Biological Opinion.

B. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize the take of UR cutthroat trout and OC coho salmon.

1. The COE shall ensure that ASKC will maximize the quantity and quality of in-stream habitat in the realignment and habitat enhancement of the lower portion of the Cook Creek tributary.

2. The COE shall ensure that ASKC will maximize the effectiveness of the riparian areas of the lower portion of the Cook Creek tributary and of the section of Cook Creek on ASKC property.

3. The COE shall ensure that ASKC will provide unimpeded upstream access by fish and other aquatic life to the enhanced reaches of Cook Creek and its tributary.

C. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the COE shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The COE shall require ASKC to request and follow the on-site direction of NMFS and/or ODFW biologists in the realignment and habitat enhancement of the lower portion of the Cook Creek tributary. This direction shall include: Stream gradient, dimensions and sinuosity of high- and low-flow channels; pool and alcove spacing and dimensions; size, quantity, and location of large woody material; and size, quantity, and location of gravel.

2a. The COE shall require ASKC to seed and ensure the germination and growth of native grass species on all disturbed ground within the riparian areas of Cook Creek and its UT prior to the wet season. Woody vegetation should be planted during the first appropriate season following ground disturbance.

2.a. The COE shall require ASKC to maintain the riparian plantings proposed for the lower portion of the Cook Creek tributary and for Cook Creek. This maintenance shall include necessary irrigation and protection from grounds keeping activities. A minimum of 80% annual planting survival should be required of ASKC for at least 5 years, and some sort of physical barrier (e.g. a fence) should delineate the riparian planting areas—where mowing, pruning, pesticide and herbicide use, etc., should not occur—from more conventional landscaping. The riparian planting area should be perpetually maintained in the untidy condition typical of natural riparian zones, although mechanical removal of invasive weeds from the riparian zone, such as Himalayan blackberry, should be a part of the maintenance.

2b. The COE shall require ASKC to demonstrate the maintenance of the riparian plantings through annual photographic monitoring. At least four photo points should be established— at least one of which should be a wide-angle view from the hill to the north of the tributary—from which photographs of the riparian areas should be taken at least once during the growing season. Copies of the photos should be provided annually, by December 31 of each year, to the COE, NMFS, and ODFW for at least 5 years following the plantings.

3. The COE shall require the ASKC to follow ODFW culvert passage guidelines in the construction of the new culvert under the golf course entrance road.

4. All general and specific conditions of the 404(b)(1) permit by the COE shall be implemented by ASKC.

5. Minimization/avoidance measures listed in Attachment 1 for in-water work, erosion control, hazardous materials, riparian impacts, and monitoring shall be implemented by ASKC for the project, in accordance with the terms and objectives of Attachment 1. Although Attachment 1 specifically deals with road-construction and maintenance activities of ODOT, the measures, terms, and objectives are directly applicable to the proposed activities.

ATTACHMENT 1

ODOT General Minimization/Avoidance Measures

The following Minimization/Avoidance Measures will be followed on all construction actions described in the South Coast Basins Biological Assessment (BA). Relevant measures will be included in the Special Provisions produced for the actions described in this programmatic BA, enforceable by law.

In-Water Work General

- Passage shall be provided for both adult and juvenile forms of all salmonid species throughout the construction period. ODOT designs will ensure passage of fishes as per ORS 498.268 and ORS 509.605.

- All work within the active channel of all anadromous fish-bearing systems, or in systems which could potentially contribute sediment or toxicants to downstream fish-bearing systems, will be completed within ODFW's in-water work period. This in-water work period varies by system.[2] Any extensions of the in-water work period will first be approved by and coordinated with ODFW.

- During ODOT project design, ODOT will work to minimize the amount of riprap used. In unshaded areas above the 5-year floodplain which are not scour-critical, ODOT will attempt to use biological bank control, or to backfill with native soil and plant with willow and other riparian species. This installation will increase riparian shading and cover. Where riprap is necessary, only clean, non-erodible, upland angular rock of sufficient size for long-term bank armoring will be employed.

- Alteration or disturbance of stream banks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material shall be placed to maintain normal waterway configuration. Waterway bank slopes will be left no steeper than 1:2.

- In areas with riprap installation, larger riprap (class 350 metric minimum) will be used preferentially within the 2-year floodplain of systems, where this riprap would come into contact with actively flowing water, and where using larger riprap would not constrict the size of the active channel (larger rock sizes create larger interstitial spaces for juvenile salmonids). Placement will be performed "in the dry" as much as possible, and from the top of the bank where possible. Riprap areas will be planted with willow stakes (and other riparian shrubs/ tress) to increase shading and cover within the 1 0-year floodplain, where appropriate. Willow stakings will be of a species appropriate for the physiographic province and will be planted at an approximate density of 2000/ ha (generally).

Erosion Control

---

[2]Many non-estuarine systems have an in-water work period during the driest portions of the year.

For all projects with the potential to contribute sediment to aquatic resources, an Erosion Control Plan (ECP) will be prepared by ODOT's Erosion Control Team and implemented by the Contractor. The ECP will outline how and to what specifications various erosion control devices will be installed to meet water quality standards, and will provide a specific inspection protocol and time response. Erosion control measures will be sufficient to ensure that turbidity does not exceed 10% above ambient (background) conditions.

- Erosion Control measures shall include (but not be limited to) the following:
  - Sediment detention measures such as placement of weed-free straw bales and silt fences at the bottom of newly-constructed slopes.
  - Construction of sediment settling basins where appropriate. Berms shall be constructed where appropriate, to divert runoff into these basins.
  - Temporary plastic sheeting for immediate protection of open areas (where seeding/ mulching are not appropriate).
  - Erosion control blankets or heavy duty matting (e.g., jute) may be used on steep unstable slopes.
  - Sills or barriers may be placed in drainage ditches along cut slopes and on steep grades to trap sediment and prevent scouring of the ditches. The barriers will be constructed from rock and straw bales.
  - Biobags, weed-free straw bales and loose straw may be used for temporary erosion control. Temporary erosion and sediment controls will be used on all exposed slopes during any hiatus in work on exposed slopes.
- Effective erosion control measures shall be in-place at all times during the contract. Construction within the 5-year floodplain will not begin until all temporary erosion controls (e.g., straw bales, silt fences) are in-place, downslope of project activities within the riparian area. Erosion control structures will be maintained throughout the life of the contract.
- All temporarily-exposed areas will be seeded and mulched. Erosion control seeding and mulching, and placement of erosion control blankets and mats (if applicable) will be completed on all areas of bare soil within 7 days of exposure within 30 meters of waterways, wetlands or other sensitive areas, and in all areas during the wet season (after October 1). All other areas will be stabilized within 14 days of exposure. Efforts will be made to cover exposed areas as soon as possible after exposure.
- All erosion control devices will be inspected during construction to ensure that they are working adequately. Erosion control devices will be inspected daily during the rainy season, weekly during the dry season, monthly on inactive sites. Work crews will be mobilized to make

immediate repairs to the erosion controls, or to install erosion controls during working and off-hours. Should a control measure not function effectively, the control measure will be immediately repaired or replaced. Additional controls will be installed as necessary.

- If soil erosion and sediment resulting from construction activities is not effectively controlled, the Engineer will limit the amount of disturbed area to that which can be adequately controlled.

- Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 12 cm. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.

- Where feasible, sediment-laden water created by construction activity shall be filtered before it leaves the right-of-way or enters an aquatic resource area. Silt fences or other detention methods will be installed as close as possible to culvert outlets to reduce the amount of sediment entering aquatic systems.

- A supply of erosion control materials (e.g., straw bales and clean straw mulch) will be kept on hand to cover small sites that may become bare and to respond to sediment emergencies.

- All equipment that is used for instream work will be cleaned prior to entering the two-year floodplain. External oil and grease will be removed, along with dirt and mud. Untreated wash and rinse water will not be discharged into streams and rivers without adequate treatment.

- On cut slopes steeper than 1:2 a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, a hydro-mulch will be applied at 1.5 times the rate.

- Material removed during excavation shall only be placed in locations where it cannot enter sensitive aquatic resources. Conservation of topsoil (removal, storage and reuse) will be employed.

- Measures will be taken to prevent construction debris from falling into any aquatic resource. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

<u>Hazmat</u>

- ODOT actions will follow all provisions of the Clean Water Act (40 CFR Subchapter D) and DEQ's provisions for maintenance of water quality standards not to be exceeded within the Rogue Basin (OAR Chapter 340, Division 41). Toxic substances shall not be introduced above natural background levels in waters of the state in amounts which may be harmful to aquatic life. Any turbidity caused by this project shall not exceed DEQ water quality standards.

- The Contractor will develop an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan (PCP), and is responsible for containment and removal of any toxicants released. The Contractor will be monitored by the ODOT Engineer to ensure compliance with this PCP. Sediment releases greater than 10% above background levels will not be acceptable. No toxicants. including green concrete will be allowed to enter any aquatic resource.

- No toxicant (including petroleum products) will be stored or transferred within 50 m (165 feet) of any waterbody. Areas for fuel storage, refueling and servicing of construction equipment and vehicles will be located at least 50 m away from any waterbody.

- Hazmat booms will be installed in all aquatic systems where:

  a) Significant in-water work will occur, or where significant work occurs within the 5-year floodplain of the system, or where sediment/toxicant spills are possible.

  b) The aquatic system can support a boom setup (i.e. the creek is large enough, low-moderate gradient).

  c) A significant aquatic resource occurs downstream or within the project area.[3]

- Hazmat booms will be maintained on-site in locations where "Diapering" of vehicles to catch any toxicants (oils, greases, brake fluid) will be mandated when the vehicles have any potential to contribute toxic materials into aquatic systems.

- No surface application of nitrogen fertilizer will be used within 15.2 meters (50 feet) of any aquatic resource.

Riparian issues

- Where appropriate, boundaries of the clearing limits will be flagged by the project inspector of ODOT. Ground will not be disturbed beyond the flagged boundary.

- Alteration of native vegetation will be minimized. Where possible, native vegetation will be clipped by hand so that roots are left intact. This will reduce erosion while still allowing room to work. No protection will be made of invasive exotic species (e.g. Himalayan blackberry)

- All exposed areas greater than 100 m^2 within the riparian corridor will have a replanting plan which is appropriate for the local overstory/understory plant community. The replanting plan will emphasize endemic riparian species.

- Riparian overstory vegetation removed will have a replacement rate of l.5:1. Replacement will occur within the project vicinity where possible and within the watershed at a minimum.

---

[3]Significant aquatic resources may include estuaries, spawning areas, or rearing areas.

- ODOT will require a contract grow period for all riparian mitigation plantings. In extremely unstable or unproductive areas, ODOT may release the Contractor from the contract grow period and develop a larger replanting area to compensate for this.

Monitoring

- All significant riparian replant areas, streambank and channel restoration/enhancement actions, and off-channel mitigation sites will be monitored to insure the following:

  a) Finished grade slopes and elevations will perform the appropriate role for which they were designed.

  b) Log and rock structures are placed appropriately and adequately secured.

  c) Plantings are performed correctly and have an adequate success rate.

- Mitigation site monitoring will ensure that mitigation commitments have an adequate success rate to replace the functions they were designed to replace. ODOT Biology staff will produce post-construction and biannual reports on success of mitigation sites, available on request.

- Failed plantings and structures will be replaced, if replacement would potentially succeed. In cases of failed design, mitigation will generally be sought on another project, in a more appropriate location.

- ODOT will require a contract grow period for all riparian mitigation plantings. In extremely unstable or unproductive areas, ODOT may release the contractor from the contract grow period and develop a larger replanting area to compensate for this.